

The following listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Cancelled):
2. (Cancelled):
3. (Cancelled):
4. (Cancelled):
5. (Cancelled):
6. (Currently Amended): An apparatus for separating a feed gas containing at least methane, C₂ components and heavier components ~~into a fraction containing a predominant portion of the methane and lighter components and a fraction containing a predominant portion of the C₂ and heavier components~~, said apparatus comprising:
 - (a) a first separation means for receiving feed gas and for providing a first residue vapor and a first liquid containing C₂ which liquid also contains lighter hydrocarbons;
 - (b) a heavy-ends fractionation column means connected to receive at least a portion of a first part of said first liquid containing C₂, the heavy-ends fractionation column means being adapted to separate the first liquid C₂ into a second residue containing lighter hydrocarbons and a second liquid containing C₂ product;
 - (c) a light-ends fractionation column means connected to said separation means to receive at least part of said first residue vapor, ~~and at least part of the cooled first part of the third liquid to commingle said vapor and liquid in~~ said light-ends fractionation column means having at least one contacting stage, ~~and including the separation means for removing a separating the fourth vapor, and means for removing a fourth liquid, after contact in said stage, and being further connected to supply, via heat exchange, the said means for removing said fourth liquid being connected separated therein~~ to said heavy-ends fractionation column as a feed thereto.

7. (Currently Amended): ~~An~~ The apparatus according to claim 6, wherein said light-ends fractionation column comprises ~~includes~~ fractionation means for counter-current vapor-liquid contact and wherein said light-ends fractionation column is connected to receive said first residue vapor therein below said fractionation means ~~and to receive the cooled first part of the third liquid above said fractionation means, said fractionation means thereby being adapted so that the first residue vapor rises there through in counter current contact with said cooled first part of the third liquid.~~

8. (New): An apparatus according to claim 6, further comprising:
a reflux separator positioned between said separation means and said heavy ends fractionation column,
means for supplying at least part of a second part of said first liquid containing C₂ to said reflux separator,
means for removing a third liquid from said reflux separator,
means for removing a third residue vapor from said reflux separator,
means for delivering a first part of said third liquid to a heat exchanger to cool said first part of said third liquid,
means for delivering at least part of the cooled first part of said third liquid from said heat exchanger to said light-ends fractionation column means, wherein said at least part of said first residue vapor and said at least part of the cooled first part of the third liquid to commingle in said at least one contacting stage, and
means for delivering a second part of said third liquid to said heavy-ends fractionation column means.

9. (New): An apparatus according to claim 7, further comprising:
a reflux separator positioned between said separation means and said heavy ends fractionation column,
means for supplying said first part of said first liquid containing C₂ to said reflux separator,
means for removing a third liquid from said reflux separator,
means for removing a third residue vapor from said reflux separator,

means for delivering a first part of said third liquid to a heat exchanger to cool said first part of said third liquid,

means for delivering at least part of the cooled first part of said third liquid from said heat exchanger to said light-ends fractionation column means, wherein said at least part of said first residue vapor and said at least part of the cooled first part of the third liquid to commingle in said at least one contacting stage, and

means for delivering a second part of said third liquid to said heavy-ends fractionation column means as said at least a portion of said first part of said first liquid containing C₂.

10. (New): An apparatus according to claim 9, wherein the connection for receiving said at least part of said first residue in said light-ends fractionation column is positioned below said fractionation means, and said means for delivering at least part of the cooled first part of said third liquid from said heat exchanger to said light-ends fractionation column means is connected to said light-ends fractionation column means above said fractionation means.

11. (New): An apparatus for separating a hydrocarbon feed gas into a lighter fraction containing methane and a heavier fraction containing C₂ hydrocarbons, said apparatus comprising:

a separator, said separator comprising an inlet for receiving a hydrocarbon feed gas containing methane, C₂ hydrocarbons, and heavier hydrocarbons, a first outlet for discharging a first residue vapor, and a second outlet for discharging a first liquid,

a light-ends fractionation column, said light-ends fractionation column comprising a first inlet for introducing at least a part of said first residue vapor, a first outlet for discharging a fourth residue vapor containing methane, and a second outlet for discharging a fourth liquid,

means for delivering said at least a part of said first residue vapor from said first outlet of said separator to said first inlet of said light-ends fractionation column,

a heavy-ends fractionation column, said heavy-ends fractionation column comprising a first inlet for introducing at least a portion of said first liquid, a first outlet for discharging a second residue vapor, and a second outlet for discharging a second liquid containing C₂ hydrocarbons,

means for delivering said at least a portion a first part of said first liquid from said second outlet of said separator to said first inlet of said heavy-ends fractionation column, a reflux separator, said reflux separator comprising an inlet for introducing at least a portion of a second part of said first liquid, a first outlet for discharging a third residue vapor, and a second outlet for discharging a third liquid, and means for delivering said at least a portion a second part of said first liquid from said second outlet of said separator to said inlet of said reflux separator.

12. (New): An apparatus according to claim 11, further comprising means for delivering at least a portion a of said fourth liquid from said second outlet of said light-ends fractionation column to said first inlet of said heavy-ends fractionation column.

13. (New): An apparatus according to claim 11, further comprising means for delivering said at least a portion of said second residue vapor from said first outlet of said heavy-ends fractionation column.

14. (New): An apparatus according to claim 12, further comprising means for delivering said at least a portion of said second residue vapor from said first outlet of said heavy-ends fractionation column.

15. (New): An apparatus according to claim 11, further comprising means for delivering said at least a portion of a first part of said third liquid to a second inlet of said light-ends fractionation column.

16. (New): An apparatus according to claim 14, further comprising means for delivering said at least a portion of a first part of said third liquid to a second inlet of said light-ends fractionation column.

17. (New): An apparatus according to claim 11, further comprising means for delivering said at least a portion of a second part of said third liquid to a second inlet of said heavy-ends fractionation column.

18. (New): An apparatus according to claim 16, further comprising means for delivering said at least a portion of a second part of said third liquid to a second inlet of said heavy-ends fractionation column.

19. (New): An apparatus according to claim 11, further comprising means for delivering at least a portion of said second residue vapor from said first outlet of said heavy-ends fractionation column to said inlet of said reflux separator.

20. (New): An apparatus according to claim 18, further comprising means for delivering at least a portion of said second residue vapor from said first outlet of said heavy-ends fractionation column to said inlet of said reflux separator.

21. (New): An apparatus according to claim 11, further comprising means for combining said third residue vapor and said fourth residue vapor, said means for combining being connected to said first outlet of said reflux separator and connected to said first outlet of said light-ends fractionation column.

22. (New): An apparatus according to claim 11, further comprising a turbo expander for expanding said first residue vapor prior to being introduced into said light-ends fractionation column.

23. (New): An apparatus according to claim 15, further comprising a heat exchanger for cooling said at least a portion of said first part of said third liquid prior to being introduced into said light-ends fractionation column.

24. (New): An apparatus according to claim 16, further comprising a heat exchanger for cooling said at least a portion of said first part of said third liquid prior to being introduced into said light-ends fractionation column.